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FRENCH PARTICIPATION IN THE BOTANIC CARTOGRAPHY
OF FRENCH-SPEAKING WEST AFRICA^{*}

(Document submitted by the French Government)

^{*}This note is supplemented by a paper entitled: Work on Africa done by the Institut de la Carte Internationale du tapis végétal (E/CN.14/CART/12/Add.1).

FRENCH PARTICIPATION IN THE BOTANICAL CARTOGRAPHY OF FRENCH-SPEAKING
WEST AFRICA

by

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From the beginning of the XIXth century, after the sensational explorations of the "equinoctial regions" by A. de Humboldt, founder of the explanatory method of biogeographic phenomena, the Danish botanist Schouw, with remarkable perspicacity, recognized the phytogeographic applications to the economy. He wrote:

"A good botanic map can often give a more comprehensive view of the productive capacity of a country and its growth potential than many statistical tables. An exact knowledge of the connexion between climate and vegetation obviates much useless expenditure". (5)^{1/}

One hundred years later, however, at the beginning of the XXth century, the ministerial administrative authorities failed to recognize the value of the masterly graphic syntheses of Ch. Flahault, who covered one-tenth of the area of our country; and it was not until 1948 that the French Government in its official report to OEEC, attached "a very special importance to the development of technical research and the dissemination of modern methods of both production and work organization". (5)

The continuing growth of the world's population places the question of agricultural output in the first rank of world preoccupations, both in the rich, developed countries and in the under-developed or backward countries of the Tiers-monde.

More often than not better cultivation means replacing natural primitive vegetation by another, economically more rewarding vegetation, to which man gives all his attention.

^{1/} Figures in brackets relate to the bibliography.

- La carte économique de la région Chari-Lac Tchad by Aug. Chevalier (The economic map of the Chari-Lake Chad Region) (4);
- Aire de l'Okoumé (Marchés coloniaux, No. 270, 1951) (Okoumé Area (colonial markets, No. 270, 1951));
- Aire du Kapokier, du Karité et du Gommier au Soudan (Mali, on the scale approximately 1/6.400.000) Agro.Trop. VII, 4, 1952. (Area of Kapok tree, Shea tree and Gum tree in the Sudan (Mali, on approximate scale 1:6,400,000) Agro.Trop. VII, 4, 1952)).

The map of flora units: If the boundary areas of a great number of plants are superimposed on one and the same map it will be seen that many of them cover the same regions. Thus are delimited territories of greater or less extent, characterized by the co-existence of a whole flora aggregate.

A certain order is therefore apparent in the spatial distribution of systematic units, although the area of each, considered separately, has not been acquired under the sole influence of existing circumstances and reference must be made to its history and the migrations it has suffered.

The fact, however, is there: because privileged regions have been the centres where species were formed or whence they were dispersed, there are comprehensive groups to which floral names have been given: Euro-Siberian flora, paleo-tropical flora.

It should be noted straight away that representatives of the characteristic flora are not the only flora to be found in a "dition"^{1/}. It is possible that there are survivals from former occupants; the neighbouring "ditions" may have sent migratory currents. There are thus many superimposed flora but the most numerous is chosen to characterize, florally, the territory under consideration.

To illustrate this paragraph, I shall mention Th. Monod with his 1:34,000,000 map of the phytochorologic divisions of Africa (11) and A. Aubreville who, in his Flora of Congo has given a sketch of flora territories. (3)

^{1/} Dition: territorial surface considered in absolute value, independently of any biologic, ethnographic, administrative subdivision or any other kind of subdivision.

These representations are inevitably more subjective than those on areas because personal interpretation plays an important role. It is not surprising, therefore, that the boundaries, drawn by different authors, do not exactly tally with each other. The terms themselves, particularly Floral Empire and Floral Region, are not universally accepted or do not respond to the same definition.

The important thing here is rather to understand the spirit in which these maps are prepared than to measure the differences of interpretation which may separate them.

Moreover, flora and vegetation are very closely intertwined on the ground: although their history is different they in fact depend on each other. Flora does not exist in the pure state, as if disincorporated: it becomes reality only through the plants whose existence is subject to all the constraints of the environment. It is not surprising, therefore, to note that in West Africa the boundaries of floral units are often those of phytogeographic territories and of types of vegetation about which we shall now speak.

2. Vegetation maps

Their purpose is to give material boundaries in space to :

- A. The phytogeographic territories each characterized by their climate, flora and vegetation.
- B. The types of vegetation (13) and the vegetal groupings distinguished on the land.
- A. The boundaries of phytogeographic territories of West Africa: this concern to show in material form on maps of various scales the division of West Africa, wholly or partly into territories characterized by their vegetation was the very first undertaking of phytogeographers but it is by no means finished.

Without trying to compile an exhaustive inventory or wishing to refer back to the work of precursors (Grisebach 1872, Drude 1897, Schimper 1898, Engler 1910), and limiting myself to French authors, I shall mention:

- 1912 - Chevalier (Aug.): Carte botanique, forestière et pastorale au 1/3.000.000 d l'AOF. (Botanic, forestry and pasture-land map of French West Africa on the scale 1:3,000,000). La Géographie, Paris, XXVI, No. 4.
- 1924 - Mangin (C.) Esquisse forestière de l'AOF au 1/3.000.000 (Forestry outline on scale 1:3,000,000 of French West Africa). La géographie, Paris XLII, Nos. 4 and 5.
- 1933 - Chevalier (Aug.): Carte géobotanique au 1/3.000.000 de l'ouest africain (Geobotanic map on scale 1:3,000,000 of West Africa). Bull.Soc.Bot. France, LXXX.
- 1934 - Hubert (H.): Les zones botaniques en AOF au 1/3.000.000. (Botanic zones in West Africa on scale 1:3,000,000. Atlas des colonies françaises, Paris, Soc. d'éditions.
- 1936 - Aubreville (A.): Types de forêts et courbes pluviométriques de la Côte d'Ivoire au 1/12.000.000 (Forest types and pluviometric curves of the Ivory Coast on scale 1:12,000,000) in Flore forestières de la Côte d'Ivoire, Paris, Larose et ibid. 2nd éd. 1959.
- 1937 - Aubreville (A.): Croquis des formations forestières du Togo-Dahomey (Sketch of forest formations in Togo-Dahomey). Bull. Com.ét.Hist.et Scientif. AOF, XX No. 1 et 2.
- 1940 - Roberty (G.): Contribution à l'étude phytogéographique de l'AOF, (Contribution to the phytogeographic study of French West Africa). Candollea, Genève, VIII, p.83-137, une carte.
- 1948 - Aubreville (A.): Croquis de la végétation forestière actuelle et ancienne (de l'Oubangui-Chari, du Tchad et du Cameroun). Etude sur les forêts de l'Afrique équatoriale française et du Cameroun. (Sketch of present and former forest vegetation (of Oubangui-Chari, of Chad and Cameroun). Study of the forests of French Equatorial Africa and Cameroun). Publication de la Direction de l'Agriculture, de l'Élevage et des Forêts, Ministère de la FOM, Bull.No.2, p.92.

- 1949 - Richard-Molard (J.): Les climats et les milieux naturels (en A.O.F.). Un croquis schématique (Climates and natural environments (in French West Africa). A schematic sketch in AOF. Coll. Union française. Berger-Levrault, Paris, P.41.
- 1949 - Pitot (A.): AOF, répartition de la végétation (French West Africa, distribution of vegetation). Encyclopédie coloniale et maritime, T.I., Paris, p.181.
- 1949 - Aubreville (A.): Forêts claires en Afrique tropicale au 1/40.000.000 (Sparsely wooded forests in tropical Africa on scale 1:40,000,000) in Climats, forêts et désertifications de l'Afrique (Climates, forests and desert lands of Africa), p.255 - Société d'Editions, Paris.
- 1949 - Aubreville (A.): Aire Actuelle et ancienne des forêts d'Afrique tropicale au 1/40.000.000 (Present and former forest area of Tropical Africa on scale 1:40,000,000). Ibid. p.206.
- 1952 - Schnell (R.): Subdivisions géobotaniques de l'ouest africain au 1/7.000.000 (Geobotanic sub-divisions of West Africa on 1:7,000,000). Mem.IFAN, No. 18.
- 1954 - Trochain (J.L.): Les territoires phytogéographiques de l'Afrique de l'ouest au 1/40.000.000. (The phytogeographic territories of West Africa on scale 1:40,000,000). Naturalia, Nos. 6 and 7.
- 1959 - Aubreville (A.): Types de végétation de la Côte d'Ivoire au 1/4.500.000 (Types of vegetation of the Ivory Coast on scale 1:4,500,000) in Flore forestière de la C.I., Centre technique forestier tropical, Paris, p.19.

B. Mapping of vegetation groupings: The purpose of these maps corresponds more precisely with the aims stated in the introduction to this report, for they will, as has been said, materialize in terms of space, the reflection of environmental conditions.

There is no objection, - in fact quite on the contrary - to them indicating also on a suitable scale the distribution of spontaneous vegetation and the present use of land (crops, forests, pasture-land). Even more, by graphically translating the environmental conditions which authorize this spontaneous vegetation, they should permit deductions on the potential use and nature of the soil and guide experiments.

Their practical worth by thus supplying a picture of what is and what could be with respect to the rational development and better use of the soil, the substitution of the present vegetation by another more remunerative or more desirable, and the inventory of vegetal forestry and agricultural resources cannot be denied.

The scale used to meet this utilitarian concern should be greater than 1,000,000. Smaller ratios only provide outlines permitting general views and the preparation of larger scale maps. The following works come into this category:

- 1950 - Jacques-Felix (H.): Formations végétales du Cameroun à l'échelle du 1/7,000,000 (Vegetal formations of Cameroun, on the scale of 1:7,000,000).
- 1958 - Mangenot (G.) and Miegé (J.): Esquisse botanique de la Côte d'Ivoire (échelle: 1/2,500,000) (Botanic sketch of the Ivory Coast (scale 1:2,500,000)). Actes du Coll. de Kandy, publi. UNESCO, Paris.
- 1959 - AETFAT: Carte de la végétation de l'Afrique au Sud du Tropique du Cancer (au 1/10,000,000) (Vegetation map of Africa south of the Tropic of Cancer (on 1:10,000,000)) University Press, Oxford.
- 1961 - Letouzey (R.): Carte phytogéographique du Cameroun (au 1/2,000,000) (Phytogeographic map of Cameroun (on 1:2,000,000)) in Atlas of Cameroun, IRSC, Yaoundé.

It is on the scale of 1:1,000,000 and even better of 1:200,000, or larger scales, that African phytogeographic maps can be of assistance to non-botanist users.

The titles of many appear in the appendix to this report because they were conceived or designed by a team under the leadership of Professor H. Caussen (7). They are:

- 1950 - Roberty (G.), Gaussen (H.) and Trochain (J.L.): Carte de la végétation de Thiès (Sénégal) au 1/200.000 (Vegetation map of Thiès, Senegal, on scale 1:200,000). ORSOM, Paris.
- 1953 - Roberty (G.): Carte de la végétation de Bouaki (Côte d'Ivoire) au 1/200.000 (Vegetation map on scale 1:200,000 of Bouaki (Ivory Coast). ORSOM, Paris.
- 1955 - Roberty (G.): Carte de la végétation de Diafarabé (Mali) au 1/200.000 (Vegetation map on scale 1:200,000 of Diafarabé, Mali). ORSTOM, Paris.

Other cartographical works besides those produced by the Institut de la Carte internationale du Tapis végétal have been successfully completed.

They are:

- 1956 - Roberty (G.): Carte de la végétation de Louga (Sénégal) au 1/200.000 (Map of the vegetation of Louga (Senegal) on scale 1:200,000). ORSTOM, Paris.
- 1959 - Derbal (Z.), Pagot (J.) and Lahore (J.): Carte botanique (des terrains du Centre de Recherches Zootechniques de Bamako-Lotuba) au 1/20.000 (Botanical map of the grounds of the Zootechnical Research Centre of Bamako-Lotuba on scale 1:20,000). Bureau des sols de l'A.O. Paris, Vigo publishers.
- 1961 - Koochlin (J.): Esquisse de la végétation au 1/1.000.000 in: la végétation des savanes dans le sud de la République du Congo (Brazzaville). (Outline of vegetation on scale 1:1,000,000 in Savannah vegetation in the south of the Republic of Congo (Brazzaville). IRSC. Brazzaville.

It should perhaps be pointed out that at Toulouse the work on vegetation maps is carried on in collaboration by three organizations which work in a pool in pursuance of a single set of common principles.

- Le Service de la carte de la végétation de la France au 1:200.000
(The Service for the vegetation map of France on scale 1:200,000),
which is a branch of the CNRS (National Scientific Research Centre)
and directed by Mr. P. Roy.
- Le troisième cycle de Biogéographie (The Third Biogeographic Cycle),
which comes under the Faculty of Science and which is directed by
the author of this report.
- L'Institut de la carte international du tapis végétal (The Institute
of the International Map of Vegetation Cover) which is directed by
Professor H. Gaussen.

If I mention him last it is that I may be better able to pay him tribute for he is the originator of the cartographic method followed at Toulouse and is the founder of the three above-mentioned organizations, the first two of which are directed by two of his pupils.

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- (2) Aubreville (A.) Tropical Africa in World geography of Forests
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Ronald Press Cy. New York, 1956, p.367.
- (3) Aubreville (A.) Flore du Gabon No. 3
Paris, Muscum Nat. Hist. Nat. 1962, p.7
- (4) Chevalier (A.) L'Afrique centrale française. Mission Chari-
Lac Tchad (1902-1904).
Paris, 1907, une carte h.t. au 1/3.000.000.
- (5) CNRS Service de la carte phytogéographique.
1 broch. ill. p.79, 1955.
- (6) Direction du plan Carte économique No. 1 au 1:5.000.000 (Agriculture,
Forêts, Elevage) de l'AEF.
I.G.N., Paris, 1956.

- (7) Gaussen (H.) Les cartes de végétation. Trav.section scientifique et technique Inst. français de Pondichery
I, No. 2, p. 51-87 (avec bibliogr.) 1957.
- (8) Koochlin (J) Esquisse de la végétation au 1/1.000.000 in: la végétation des savanes dans le sud de la République du Congo (Capitale: Brazzaville) I.R.S.C. Brazzaville, 1961.
- (9) Meunier (A.) Cartes économiques de l'AOF au 1/3.000.000 Cultures alimentaires, fourragères et médicinales.
Paris, 1922.
- (10) Monod (Th.) Notes biogéographiques sur l'Afrique de l'ouest Portug, Acta Biologica II, 3,
P, 208-285, 27 fig. 1947.
- (11) Monod (Th.) Les grandes divisions chorologiques de l'Afrique C.S.A. Publ. No. 24, p. 147, III ph dont une carte dép. 1957.
- (12) Trochain (J.L.) La cartographie botanique. Application à la feuille de Thiès (Sénégal).
Bull. Inst. Etudes Centrafricaines,
Paris-Brazzaville No. 7-8 p. 187-200, 1954.
- (13) Trochain (J.L.) Accord interafricain sur la définition des types de végétation de l'Afrique tropicale,
Bull. Inst. Etudes centrafricaines, Paris-Brazzaville. No. 13-14, p. 55-93, fig. 4-14, 1957.
- (14) Trochain (J.L.) Représentation cartographique des types de végétation intertropicaux africains.
Coll. Intern. C.N.R.S. XCVII, Toulouse 1960,
p. 87-102, 3 tabl. CNRS. 1961.
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